

**METHOD AND APPARATUS FOR ENCAPSULATING SERVICES FOR  
TRANSPORTATION OVER METALLIC PHYSICAL MEDIUMS**

5

**ABSTRACT**

A network element employing a universal mapper enables multiple services to be mapped onto a physical medium (metallic link with a particular physical layer protocol) so that the number of service mappers, and hence the complexity of the network element, may be reduced, 10 the cost of provisioning the device may be reduced, and new services may be deployed, such as Ethernet over T1. The universal mapper may be configured to generate frames for transmission over multiple physical mediums utilizing a protocol known as Generic Framing Procedure (GFP). Using this embodiment, services such as ATM, Frame Relay, Ethernet, IP/PPP, Voice, and Infiniband may be transported in GFP frames over metallic links operating using xDSL, 15 T1/E1, T3/E3, or cable access technologies by utilizing a single GFP framer and a single set of service mappers.